

Claims

[c1] [c1]

WE CLAIM:

1. In apparatus for detecting the presence of an airborne chemical or biological analyte, the improvement comprising:

a substantially gas- and liquid-impermeable container;
means for introducing a substantially analyte-free collection liquid into said container;

means for rapidly sampling ambient air and transferring said analyte therefrom into said collection liquid, said sampling means comprising an air intake means and an air venting means; and

means for removing from said container an analyte-enriched collection liquid;

wherein said volume of air passes through a substantially horizontal air inlet and upwardly through a substantially vertical collector electrode tube with means for applying an electric field between said tube and a coaxial spiked wire- or rod-shaped discharge electrode.

[c2] [c2]

2. The apparatus of claim 1, comprising means for intro-

ducing a fine mist of droplets into the air stream passing through said collector tube so as to cause wetting of the inner surface of said tube by a liquid film.

[c3] [c3]

3. The apparatus of claim 2, wherein said mist is generated by an ultrasonic humidifier.

[c4] [c4]

4. The apparatus of claim 2, comprising means for generating and transmitting ultrasonic waves across the interface between said tube and said liquid film so as to help transfer particles or biological cells adhering to the tube surface from said surface into said film.

[c5] [c5]

5. In a method for detecting the presence of an airborne chemical or biological analyte, the improvement comprising the steps of:

providing a substantially gas- and liquid-impermeable container means;

introducing a substantially analyte-free collection liquid into said container means;

rapidly sampling ambient air and transferring said analyte therefrom into said collection liquid, said sampling means comprising an air intake means and an air venting means;

removing from said container an analyte-enriched collection liquid;
passing said volume of air through a substantially horizontal air inlet and upwardly through a substantially vertical collector electrode tube; and
applying an electric field between said tube and a coaxial spiked wire- or rod-shaped discharge electrode.

[c6] [c6]

6. The method of claim 5, comprising the step of introducing a fine mist of droplets into the air stream passing through said collector tube so as to cause wetting of the inner surface of said tube by a liquid film.

[c7] [c7]

7. The improvement of claim 6, wherein said mist is generated ultrasonically

8. The improvement of claim 6, comprising the step of generating and transmitting ultrasonic waves across the interface between said tube and said liquid film so as to help transfer particles or biological cells adhering to the tube surface from said surface into said film.